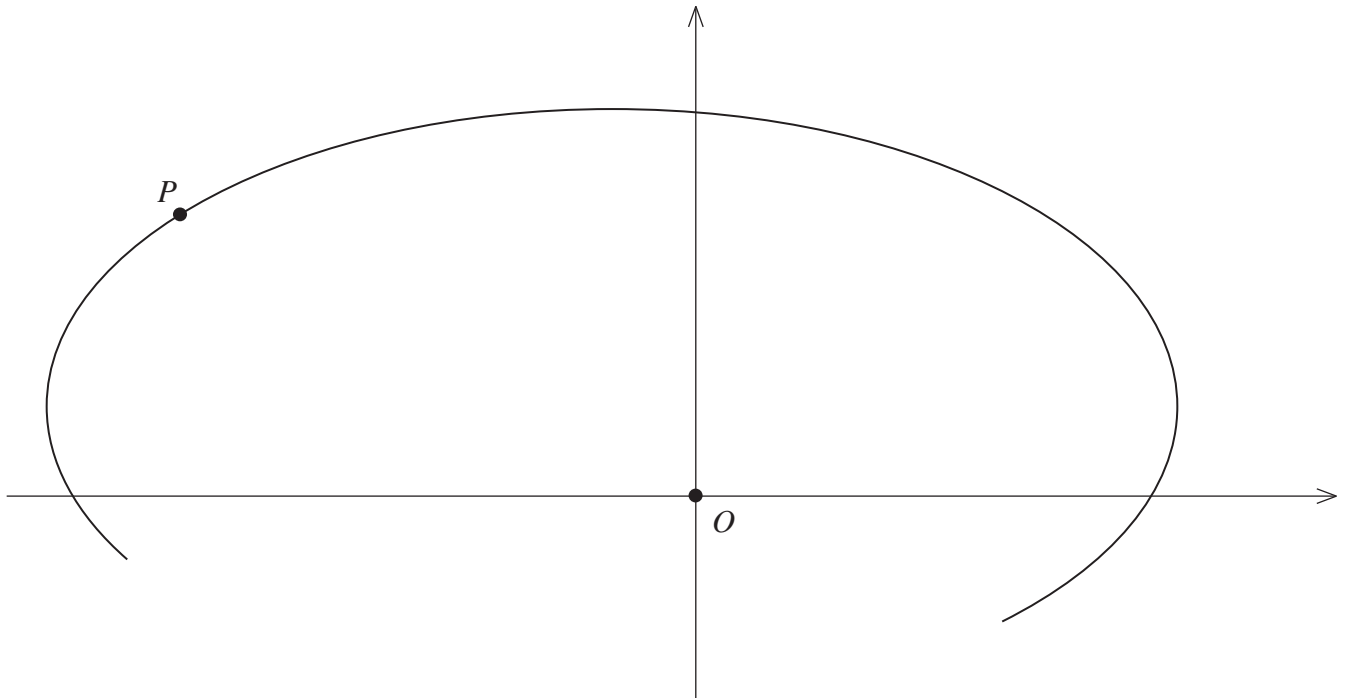


Quiz

Name _____

1. The figure below shows a Cartesian co-ordinate plane and a planet or particle P of mass m in motion under the influence of a single force, a centripetal force centered at the origin. For any time $t \geq 0$, let the position of P be given by the coordinate functions $(x(t), y(t))$. Identify (by making use of the figure) and explain the variable quantities that are basic to the study of the motion of P including those that appear in the Problem 2 that follows. (The understanding for the problem is that the polar coordinates are as yet not in play.)



2. Consider the horizontal and vertical components of the centripetal force and use the basic relationship $F = ma$ to derive the equation $y \frac{d^2x}{dt^2} = x \frac{d^2y}{dt^2}$. Use it to conclude that $x \frac{dy}{dt} - y \frac{dx}{dt} = c$ with c a constant.